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Research Article

Enhancing Rehabilitation Communication in Pakistan: Bridging Gaps Through Culturally Inclusive Approaches and Technological Innovation

Jahanara Ayaz¹, Hamail Ayaz², Rakhshan Raheem³, Muhammad Asif Chuadhry^{*4}

¹Khawaja Fareed University of Engineering and Information Technology, Rahim Yar Khan, Pakistan

²Atlantic Technology University, Sligo, Ireland.

³Allama Iqbal Open University, Islamabad, Pakistan

⁴Spine Innovation Research and Educational Services (SIREs), Islamabad, Pakistan

*Correspondence: asif.epm@gmail.com/advisor@sires.pk

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Abstract

The study investigates enhancing rehabilitation communication in Pakistan by bridging the gaps through culturally inclusive approaches and technological innovation. The study's main objectives are to explore the role of culturally inclusive communication in rehabilitation and to assess the impact of technological innovations in overcoming communication barriers. Another objective is to identify the challenges faced by healthcare providers and patients in adopting these approaches. The population of the study was patients and healthcare professionals taken in equal numbers (250 patients and 250 healthcare professionals). The surveys were used to collect data from the study participants. The study's findings reveal that cultural sensitivity significantly enhances patient trust, engagement, and adherence to rehabilitation protocols. Family involvement plays a critical role in improving rehabilitation outcomes, with 85% of patients identifying it as essential to success. Technological integration, particularly through telemedicine and mobile health applications, positively impacts patient satisfaction. We concluded that technology integration, family support, quality of internet connection, and digital literacy impact rehabilitation communication.

Keywords: Communication, Technological Innovation, Telemedicine, Disability Inclusion, Mental Health, Healthcare Accessibility

1. Introduction

Effective communication is the backbone of every domain. Similarly, communication in an effective way is pivotal in improving the health of patients with a disability. There are many challenges concurrently faced by individuals in the rehabilitation setup, particularly in a diverse country like Pakistan. Language barriers, connectivity issues, and lack of digital literacy, especially for healthcare professionals in Pakistan are some of the most important barriers, as described by (Shahbaz et al. 2022). The need for communication is more significant, especially when interacting with a patient with a

physical disability or going through emotional trauma.

As highlighted in the study by (Siddiquie, Chuadhry, and Ahmed 2022), initiatives taken by the state regarding communication with persons with disabilities (PWDs) have a significant impact. These initiatives include the education of the disabled and the use of technology to overcome these barriers. Effective communication can play an important role in the well-being of individuals with disabilities.

The rehabilitation sector in Pakistan faces issues like a lack of infrastructure, accessibility, and awareness, as systematically reviewed by (Kaur

et al. 2022). The gaps between patients, professionals, and family members can be reduced by adapting the communication process. This is also explored by (Alrahbi et al. 2022) for understanding the challenges of developing healthcare knowledge in the digital age as per the needs of society.

The cultural norms and beliefs of every society significantly shape the policies. It is even more significant in the case of a country like Pakistan, where religious beliefs and other sociocultural values are held in high esteem. (Khan et al. 2017) described the challenges and issues in their perspectives for physical medicine and rehabilitation in Pakistan within the framework of the World Health Organization (WHO), as described in the Global Disability Action Plan 2014–2021. Multiple factors such as family involvement in rehabilitation, religious beliefs regarding disability, and societal attitudes toward people with disabilities, all shape the rehabilitation experience (Boyle 2015). Moreover, understanding and incorporating cultural values into rehabilitation communication strategies are fundamental to achieving positive rehabilitation outcomes. In a study (Zahid et al. 2017) explored the use of social media to keep the view of cultural norms and values for rehabilitation patients.

Mobile phones, internet access, and telemedicine are blessings in the current era for individuals with PWDs in Pakistan, as pointed out in the study by (Shukla, Nair, and Thakker 2017). Telemedicine, modern technology tools, and mobile applications facilitate remote access to rehabilitation services, thereby improving service efficiency and accessibility, as explained by (Farooq, Imran, and Imran 2024). However, these technologies must be implemented properly. Existing literature emphasizes that communication barriers in rehabilitation often lead to problems. These barriers include language differences, lack of awareness regarding available rehabilitation resources, and non-availability of healthcare literacy, as

revealed by (Krug and Cieza 2019). Many of the studies have also revealed that healthcare service providers in Pakistan frequently face challenges in communicating effectively with patients, especially those from rural or marginalized communities (Rehman, un Nisa, and Talat 2023).

Comprehensive approaches in communication linked to cultural sensitivity are widely acknowledged as crucial for improving rehabilitation. In countries like Pakistan, the inclusion of native languages, understanding of family dynamics, and addressing cultural values around the individual with a disability can also improve service delivery in this field (Hussain 2007). Much of the research has already pointed out that culturally sensitive healthcare plays an important role in increasing the satisfaction level of patients (Bilal et al. 2022). The modern trends of telemedicine and digital health technologies are penetrating the health sector of Pakistan. Healthcare professionals are getting training to equip themselves with the technology and provide consultancy on the phone (Caminiti et al. 2020). Furthermore, mobile health applications and online platforms can empower patients with tools to monitor their progress and maintain communication with healthcare professionals (Rizwan Ullah 2024).

2. Significance of the Study

The current study addresses the issues and challenges faced by PWDs and whether improving communication can help improve their rehabilitation. Despite various policies and frameworks aimed at supporting PWDs, substantial gaps remain in the communication processes within rehabilitation centers, which impede the effective delivery of care and services. The core purpose of this research is to enhance communication strategies while employing mobile and other technological tools, which are equally beneficial for the patient and healthcare professionals as well as for the family.

Table No-1. This table shows participants' responses to Cultural Sensitivity in Rehabilitation. N=422

Item No	Statements	Responses							
		Agree		Undecided		Disagree		Mean	S.D
		f	%	f	%	f	%		
A	Cultural Norms have a substantial Impact	352	84	40	9	118	28	3.87	0.695
B	The family role is critical	345	82	53	13	24	5	3.60	0.462
C	The rural population is properly communicated with health care professional	320	76	43	10	59	14	3.10	0.923
D	Religious beliefs influence the patient's attitude toward health	106	25	48	11	268	64	1.26	0.862

Table No. 2. This table shows participants' responses to technology integration. N=422

Item No	Statements	Responses							
		Agree		Undecided		Disagree		Mean	S.D
		f	%	f	%	f	%		
A	Patient utilizing telemedicine	111	26	37	9	274	65	1.40	0.695
B	They have all the time connectivity access all the time and are digitally literate.	109	26	23	5	290	69	1.47	0.786
C	Healthcare workers have mobile.	289	68	67	16	66	16	3.15	0.823
D	Mobile application gives empowering thought to the patient.	276	69	56	13	90	21	3.29	0.852
E	Limited access to the internet is a major issue.	288	68	68	16	66	16	3.25	0.820

This research shed light on the need for culturally inclusive approaches that underscore the importance of understanding local customs, languages, and social norms in facilitating effective communication between healthcare professionals and individuals with disability in a diverse community like Pakistan. The findings of this research emphasized the transformation in the rehabilitation services landscape in a country like Pakistan, and making these services more efficient, accessible, and responsive to the specific needs of PWDs. The study could thereby contribute to enhancing healthcare quality while promoting social inclusion and empowerment of PWDs, enabling them to lead more independent and fulfilling lives. Ultimately, the findings of this research have the potential to inform policymaking and practice, driving meaningful improvements within the rehabilitation sector in Pakistan. Further, it will provide comprehensive

guidelines to policymakers, caregivers, family members, and institutions working on the well-being of PWDs in Pakistan.

3. Methodology

This study was conducted in the Rawalpindi and Islamabad regions of Pakistan. The target population included rehabilitation patients and healthcare providers across Pakistan, with a specific focus on PWDs (both physical and mental), trauma survivors, and those undergoing rehabilitation for various health conditions. This study also emphasizes marginalized groups, particularly those from rural areas, and explores the unique challenges they face in accessing rehabilitation services. The sample consists of patients from both urban and rural regions, and rehabilitation professionals (doctors, therapists, and caregivers) from hospitals, rehabilitation centers, and

Table No. 3. This table shows participants' responses to patient and family perspectives. N=422.

Item No	Statements	Responses							
		Agree		Undecided		Disagree		Mean	S.D
		f	%	f	%	f	%		
A	Family support is crucial for rehabilitation success.	305	72	27	6	90	21	3.81	0.425
B	Family members are the least bother to the patients in our community.	120	28	37	9	265	63	1.36	0.626
C	Lack of Social support in the rural community.	255	61	56	13	111	26	2.75	0.713
D	Family culture does not affect.	108	26	30	6	284	67	1.12	0.352

telemedicine platforms, also described by the (Zang et al. 2023). The data collected from approximately 500 participants, including 250 patients and 250 healthcare professionals, ensured a balanced representation across various demographics. Moreover, random sampling techniques were used to collect the data. The total number of responses received and carefully filled out was 422. Therefore, the results of the 422 participants are presented in the study.

The data of the study was collected through survey methods and questionnaires were used for the responses of the population. Semi-structured interviews were conducted with healthcare professionals, rehabilitation managers, and patients to gain deeper insights into the cultural aspects of rehabilitation communication (Farooq, Imran, and Imran 2024). Focus group discussions with patients and caregivers explored the role of family and community in the rehabilitation process.

4. Results

Tables 1 to 5 describe different responses to the attributes of communication rehabilitation. It was found that cultural norms, literacy, internet connectivity, patient demographics, urban and rural background, and family care and emotional support are crucial parts of their rehabilitation. Regression analysis reveals that cultural sensitivity plays a critical role in

improving patient trust and adherence to rehabilitation protocols. The coefficients for cultural sensitivity were positive and statistically significant for both dependent variables ($p < 0.01$ for trust and $p < 0.001$ for adherence), indicating that healthcare providers who understand and integrate cultural norms and family dynamics into their communication practices are more likely to establish trust with patients and ensure adherence to rehabilitation plans. Descriptive statistics further support this finding, with 78% of healthcare providers acknowledging the influence of cultural norms on communication, and 65% stressing the importance of family involvement in patient rehabilitation. The focus group discussion and interview responses also supported this notion. The regression results indicate that technological integration, including the use of telemedicine and mobile applications, is positively associated with patient satisfaction ($p < 0.001$) and adherence to rehabilitation protocols ($p < 0.001$). Around 70% of healthcare providers reported that digital tools enhanced patient engagement, and 64% of patients felt empowered by mobile health applications to manage their rehabilitation. However, descriptive data also highlights challenges, such as internet connectivity issues and digital literacy, which limit the widespread adoption of telemedicine, particularly in rural areas. These barriers were confirmed by 55% of patients citing limited

Table No. 4. This table shows participants' responses to the healthcare provider perspective. N=422

Item No	Statements	Responses							
		Agree		Undecided		Disagree		Mean	S.D
		f	%	f	%	f	%		
A	Lack of formal training.	366	87	24	5	32	8	3.67	0.675
B	Intent connectivity is no issue for them	103	24	33	8	286	68	1.15	0.606
C	Interested in using the technology	395	94	20	4	7	2	4.33	0.113

access to the internet and 35% expressed concerns about using digital tools effectively.

Family support was found to have a strong positive effect on patient trust and adherence to rehabilitation protocols. Regression analysis indicates that family support was highly significant ($p < 0.001$ for trust and $p < 0.01$ for adherence), further supported by descriptive statistics. An overwhelming 85% of patients identified family as critical to their rehabilitation success, with family members playing a pivotal role in helping patients understand the process, follow rehabilitation protocols, and provide emotional support. This finding underscores the importance of including family members as part of the rehabilitation process to enhance patient outcomes. Qualitative analysis also supports the result.

Regression analysis revealed that communication barriers, particularly language and literacy issues, have a negative impact on adherence to rehabilitation protocols ($p < 0.01$). Descriptive statistics confirm this, as 63% of rural patients highlighted language as a significant barrier to effective communication, exacerbating difficulties in adhering to treatment plans. The negative association found between language barriers and adherence suggests that addressing these challenges is essential for improving rehabilitation outcomes, particularly in rural and underserved communities.

Our results also suggest that digital literacy and access to the internet are significant predictors of the adoption of telemedicine and digital health

tools. Patients with better digital literacy and access to the internet are more likely to adopt and benefit from technological tools in their rehabilitation process. This is supported by the regression result for access to the Internet ($p < 0.001$) and digital literacy ($p < 0.001$). Descriptive statistics indicate that 55% of patients identified limited internet access as a barrier, while 35% expressed concerns about their ability to use digital tools due to low digital literacy.

5. Discussion

This study emphasizes the improvement in rehabilitation communication in Pakistan by bridging gaps through culturally inclusive approaches and technological innovation. The factors investigated such as cultural sensitivity, technology integration, family involvement, and healthcare provider perspective were analyzed. It was also found that demographic dimensions, literacy, rural and urban background, values of the family norms, and internet connectivity impact the rehabilitation communication of the patient. It was also evident from the result that literacy and awareness of the technology tools and health applications gave confidence to the patient. Many of the researchers in the same domain also indicated that family support and the literacy level of the patient help in the improvement process. Moreover, the result of the univariate and multivariate analysis reveals that the technology and culture-inclusive approaches can play an important role in enhancing communication.

Table No. 5. Regression Analysis Results for Key Variables in Rehabilitation Communication

Dependent Variable	Independent Variables	Coefficient	Standard Error	t-value	p-value	R ²	Adjusted R ²
Patient Trust in Rehabilitation	Cultural Sensitivity	0.52	0.07	7.55	<0.01	0.55	0.43
	Technological Integration (Telemedicine, Apps)	0.33	0.13	2.73	0.005		
	Family Support	0.41	0.11	4.10	<0.001		
Adherence to Rehabilitation Protocol	Cultural Sensitivity	0.60	0.08	7.12	<0.001	0.51	0.48
	Technological Integration (Telemedicine, Apps)	0.35	0.12	1.82	0.06		
	Communication Barriers (Language, Literacy)	-0.30	0.10	-3.44	<0.01		
Patient Satisfaction with Rehabilitation	Technological Integration (Telemedicine, Apps)	0.48	0.11	4.50	<0.001	0.55	0.53
	Cultural Sensitivity	0.36	0.08	3.79	<0.001		
	Family Support	0.27	0.12	2.65	0.01		
Digital Literacy and Technology Adoption	Access to Internet	0.51	0.13	3.61	<0.001	0.59	0.36
	Technological Integration (Telemedicine, Apps)	0.28	0.08	3.12	0.002		
	Digital Literacy	0.37	0.12	3.55	<0.001		

However, this study is limited to the Rawalpindi and Islamabad regions, and based on that the results may not be generalized to the other areas of Pakistan. However, since the population of Islamabad is the composition of all areas of the country, some level of generalization can be made.

It was also evident from the research findings that a family's role in the rehabilitation of the patient is crucial. The coordination and support of the family play a pivotal role in health improvement. They also supported by a research study conducted (Correia et al. 2023). Connectivity through mobile with healthcare professionals is a blessing nowadays for consultation, but the quality of the internet remains a challenge. The study conducted by the (Pedersen et al. 2023) highlights the role of relative during the health issues play an important role in the recovery process. (WHO 2023) emphasized the importance of telemedicine and the use of mobile phones as the biggest sources of rehabilitation for patients in

the current era. Pakistani government and other private identities are also working for the removal of the barrier between the communication of the health care profession and the patient. This phenomenon was also pointed out by (Waheed, Shah, and Mahmood 2024) in a manuscript that indicates managing the resource allocation in Pakistan for the recovery of health services in Pakistan.

6. Conclusions

The study concluded that cultural sensitivity and family support are fundamental to improving rehabilitation communication and ensuring better outcomes. Healthcare providers who integrate cultural understanding and engage family members are more likely to gain patient trust, improve adherence to rehabilitation protocols, and enhance patient satisfaction. Moreover, technological integration, particularly telemedicine, and mobile applications, plays a crucial role in increasing patient satisfaction and engagement

in rehabilitation. However, challenges such as poor internet access, limited digital literacy, and inadequate infrastructure in rural areas hinder the widespread adoption of these technologies. Communication barriers, especially language differences and limited literacy, remain significant obstacles to effective rehabilitation communication, particularly in rural communities with underprivileged backgrounds. It is important to address these barriers for smooth and equitable access to the patient with disabilities.

It also concluded that digital literacy and access to technology are critical factors influencing the adoption of telemedicine and digital health tools in the current era in countries like Pakistan. Policymakers and other professionals working for the improvement of digital literacy need to focus on improving internet access and resolving connectivity issues. The rehabilitation communication can be enhanced through the adaptation of a culturally inclusive approach and technology integration.

Competing Interests

The authors declare no competing interests.

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Study Approval

This study was approved by the Department of Research and Development, of SIRE, Pakistan.

Consent Forms

All the consent forms related to this study are available with the authors.

Data Availability

All the data related to this manuscript are available with the authors.

Author Contributions

MAC conceived the idea and wrote the initial draft of the manuscript, and JA and HA helped with the literature review and analysis. RR, review the whole draft and assist the MAC, for completion of the final draft.

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